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08/29/00   Jc658 U.S. PTO

UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	
First Inventor or Application Identifier	RAJA TULI
Title	PORTABLE HIGH SPEED Communication Device
Express Mail Label No.	

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. [✓] *Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)

2. [✓] Specification [Total Pages 24]
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. [✓] Drawing(s) (35 U.S.C. 113) [Total Sheets 8]

4. Oath or Declaration [Total Pages 2]
a. [✓] Newly executed (original or copy)
b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
i. [ ] DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

5. [ ] Microfiche Computer Program (Appendix)
6. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
a. [ ] Computer Readable Copy
b. [ ] Paper Copy (identical to computer copy)
c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement (when there is an assignee) [ ] Power of Attorney
9. [ ] English Translation Document (if applicable)
10. [ ] Information Disclosure Statement (IDS)/PTO-1449 [ ] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [ ] Return Receipt Postcard (MPEP 503) (Should be specifically itemized)
13. [✓] *Small Entity Statement(s) (PTO/SB/09-12) [ ] Statement filed in prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) (if foreign priority is claimed)
15. [ ] Other: ....
....
....

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment:
[ ] Continuation   [ ] Divisional   [ ] Continuation-in-part (CIP)   of prior application No. _____/_____
Prior application information: Examiner _____   Group / Art Unit: _____
For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

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Signature	[signature]	Date	8/25/2000

FEE TRANSMITTAL
for FY 2000

Patent fees are subject to annual revision.
Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12.
See 37 C.F.R. §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT ($) *345.—*

Complete if Known

Application Number	
Filing Date	
First Named Inventor	*RAJA SINGH TULI*
Examiner Name	
Group / Art Unit	
Attorney Docket No.	

METHOD OF PAYMENT (check one)

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

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2. ☑ **Payment Enclosed:**
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FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity			
Fee Code	Fee ($)	Fee Code	Fee ($)	Fee Description	Fee Paid
101	690	201	345	Utility filing fee	*345.—*
106	310	206	155	Design filing fee	
107	480	207	240	Plant filing fee	
108	690	208	345	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) *345.—*

2. EXTRA CLAIM FEES

	Extra Claims	Fee from below	Fee Paid
Total Claims *19* -20** = [ ]	X [ ]	= [ ]	
Independent Claims *2* - 3** = [ ]	X [ ]	= [ ]	
Multiple Dependent		= [ ]	

**or number previously paid, if greater; For Reissues, see below

Large Entity		Small Entity			
Fee Code	Fee ($)	Fee Code	Fee ($)	Fee Description	
103	18	203	9	Claims in excess of 20	
102	78	202	39	Independent claims in excess of 3	
104	260	204	130	Multiple dependent claim, if not paid	
109	78	209	39	** Reissue independent claims over original patent	
110	18	210	9	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) ($) [ ]

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity		Small Entity			
Fee Code	Fee ($)	Fee Code	Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	380	216	190	Extension for reply within second month	
117	870	217	435	Extension for reply within third month	
118	1,360	218	680	Extension for reply within fourth month	
128	1,850	228	925	Extension for reply within fifth month	
119	300	219	150	Notice of Appeal	
120	300	220	150	Filing a brief in support of an appeal	
121	260	221	130	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidable	
141	1,210	241	605	Petition to revive - unintentional	
142	1,210	242	605	Utility issue fee (or reissue)	
143	430	243	215	Design issue fee	
144	580	244	290	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	690	246	345	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	690	249	345	For each additional invention to be examined (37 CFR § 1.129(b))	

Other fee (specify) _____

Other fee (specify) _____

* Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) [ ]

SUBMITTED BY

			Complete (if applicable)	
Name (Print/Type)	*RAJA SINGH TULI*	Registration No. (Attorney/Agent)	Telephone	*514 866 5722*
Signature			Date	*25 AUG, 2000.*

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STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (Optional)

Applicant, Patentee, or Identifier: _RAJA SINGH TULI_

Application or Patent No.: _____

Filed or Issued: _____

Title: _PORTABLE HIGH SPEED COMMUNICATION DEVICE_

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

☑ the specification filed herewith with title as listed above.

☐ the application identified above.

☐ the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☑ No such person, concern, or organization exists.

☐ Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

RAJA SINGH TULI
NAME OF INVENTOR

Signature of inventor

25 AUG 2000.
Date

NAME OF INVENTOR

Signature of inventor

Date

NAME OF INVENTOR

Signature of inventor

Date

PORTABLE HIGH SPEED COMMUNICATION DEVICE

BACKGROUND OF THE INVENTION

Field of the Invention

5

The invention relates to a host computer system, which receives information, rasterizes it, compresses it and transmits it to a portable device which decompresses the image to display it on a screen. The result is a cost effective Internet access solution which allows interaction between the device and a host

10   computer.

Description of the Prior Art

The background of the present invention includes US Patent # 5925103, Internet

15   Access Device, which describes an improved Internet access system, vastly different from the present invention. Other prior art would include palm top computers, hand-held computers and cellular telephones that have limited processing power due to design restrictions. Thus, these computers are much slower for accessing the Internet and World Wide Web.

20

SUMMARY OF THE INVENTION

The present invention relates to a portable high speed Internet access device that can access the internet and World Wide Web as a wireless device.

A principal embodiment has a Web server connected to the Internet. This server contains a virtual browser which takes the image displayed in the browser and converts this image into a bit map which is compressed, and communicates via telephone lines to a cellular telephone. The cellular telephone is connected to the high speed internet access device of the invention commonly referred to as a PDA (Personal Digital Assistant) which is comprised of a display screen, battery and related micro-electronics. This enables the PDA to receive, decompress and view the bit map image sent from the virtual browser, and more importantly, through cellular phone connectivity to be able to input data from the PDA directly onto the server. In particular, the host computer or server receives vector information or compressed data in the form of HTML, JPEG, etc., which is displayed on a web page. The virtual browser virtually displays a virtual image on the server. That image, in whole or parts, is recompressed and sent to the PDA. The recompressed data format sent to the PDA, is not necessarily in the same format as the compressed data format first received by the server.

Another embodiment of the invention involves the server receiving vector information such as HTML or text and then rasterizing it to bit map format. It can then shown in memory through the virtual browser and is recompressed through a "loss less" method and sent to the PDA.

One embodiment of the invention comprises the PDA with an electronic touch screen keyboard, which remains invisible and only appears on a portion of the display screen when called upon by touching the keyboard icon. The entire display screen is covered with a transparent touch panel, which is essentially a matrix array of electrodes, which can detect the location of any pressure points applied to it. The keyboard disappears when touching a minimizing icon,

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revealing a refreshed image of the virtual browser. When the user is viewing the image displayed by a virtual browser on the PDA, and a text message needs to be entered at a specific location on the display, the user would have to point to this specific location, and pressing on the display screen's touch panel with a

5   stylus tip, the cursor appears at that exact location, ready to input text. The keyboard would then be activated by pressing on the keyboard icon with a stylus tip, whereby a miniature keyboard layout would appear at the bottom of the display screen, with a portion of the display screen above the keyboard layout reserved to view text messages generated by the user, to be inputted in the

10   image of the virtual browser at a later time. As the user enters text characters by pressing on various locations of the touch panel above the keyboard layout, the text message appears in the area above the keyboard, and when the user is finished inputting text, pressing on the send or return icons would send the entire text message to the specific location on the web page as viewed through the

15   virtual browser on the server. The PDA device translates strokes on the touch panel above the keyboard layout into characters, and the message is sent as a string of characters. A refreshed portion of virtual browser is sent back to the PDA, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

20   In a further embodiment of the invention, an automatic keyboard feature is available to the user when scrolling through the image of the virtual browser on the PDA, and a text message is to be entered at a specific location. The user would point at the desired location to enter text and a keyboard layout automatically appears ready for text input. As text is typed, the text message

25   appears in the area above the keyboard layout, and after the send or return icons are selected, the keyboard layout disappears and the message is sent to the specific location on the virtual browser.

In another embodiment, which communicates with the virtual browser in a similar fashion, the method of text transfer to the virtual browser is different. The display

30   screen would have the keyboard layout at the bottom, with two smaller areas

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above, one of which displays text characters comprising the message being typed, and the other area displaying a background portion of the virtual browser. For each text character that is selected and appears in the text area, a message is sent to the virtual browser that tells which character is typed, and that specific

5   text character is entered in the virtual browser in the portion of the image selected for text input. A refreshed portion of virtual browser is sent back to the PDA, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

In a further embodiment, which communicates with the virtual browser in a

10   similar fashion, the method of text transfer to the virtual browser is different. The display screen would have the keyboard layout at the bottom, with two smaller areas above, one of which displays text characters comprising the message being typed, and the other area displaying a background portion of the virtual browser. For each text character that is inputted in the text window, a message

15   is sent to the virtual browser informing of the specific matrix location selected on the keyboard window. This matrix location is translated at the server end to determine what character is selected as the mapped layout of each character on the PDA keyboard is known, and this character entered in the virtual browser at the specific location selected. A refreshed portion of virtual browser is sent back

20   to the PDA, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

In another embodiment of the invention, an external keyboard is featured which is used to enter text characters as required. The keyboard interface can be wired or wireless. When the user wishes to enter text in the virtual browser, the

25   specific location is selected by pressing on the touch panel and a text window appears in a portion of the display screen ready for text input. The keyboard connected to the PDA is then used to input text, and when the enter key is pressed, the message gets sent and the text window disappears. The text message is entered in the virtual browser at the specific location selected. A

30   refreshed portion of virtual browser is sent back to the PDA, which displays the

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specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

In other embodiments of the invention, the image displayed in the virtual browser is compressed at the server in various amounts by different methods before sending to the PDA device.

Different parts of the image are compressed in different ways. Parts of the image that is text image are compressed by G4 compression techniques. Other parts of the image containing pictures are compressed by JPEG compression techniques. The entire image is converted to a raster image but different parts are converted at different depths of color. Text portions can be compressed by "loss less" techniques, which will result in complete image reproduction with no errors in text upon decompression, whereas pictures can be compressed by "lossy" techniques which upon decompression give a slightly degraded image quality for each compression. An image with black and white text and color graphics portions would be converted to a raster image, but only the text part of it reduced to black and white 1 bit and other graphics parts to 24 bit or other color raster images. Hence different parts of the image can be converted or reduced to different depths of color to resemble an actual web page with picture in color and text in black and white. The depths of color can be set by the user depending on the quality of image required, which affects the speed of refreshing the screen which also depends on the amount of graphics displayed. Text and pictures from a web page would get compressed separately at the server and then sent to the PDA. In the PDA, text or black and white portions of the image get decompressed first and displayed on the screen. Color portions get decompressed and are overlain in the image on the screen shortly after, enabling the user to view black and white portions of the image in advance.

A further embodiment would take the entire image to be viewed including all text and pictures and convert it to 1 bit raster. This file is compressed by G4 or other loss less compatible methods and sent to the PDA. When received by the PDA,

this file is decompressed for the user to view the image, and the black and white portions are displayed first which can be done quickly and the graphics portions are overlaid progressively with color.   This enables an image to be viewed quickly without the fine details of graphics, which follow moments after.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described in more detail below with respect to an illustrative embodiment shown in the accompanying drawings in which:

Fig. 1 illustrates elements in the host computer, which communicates with a remote user and the device of the invention.

Fig. 2 illustrates the image to be displayed compared with the displayable area of a browser window.

Fig. 3 shows a typical subdivision of the image to be displayed.

Fig. 4 illustrates file formats received and sent by the host computer.

Fig. 5 illustrates the displayable area of the device with respect to portions of the image, which are sequentially decompressed prior to viewing.

Fig. 6 illustrates the display screen of the device with a stylus tip used to select icons or other elements in the display.

Fig. 7 illustrates the display of the device containing a keyboard layout.

Fig. 8 illustrates the display of the device containing a keyboard layout and a text area.

Fig. 9 illustrates the device interfaced with an external keyboard layout.

Fig. 10 illustrates the display of the device containing a keyboard layout with saved files represented by icons.

Fig. 11 illustrates icons on the device and icons on the host computer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

To facilitate description, any numeral identifying an element in one figure will represent the same element in any other figure.

5   The principal embodiment of the present invention aims to provide a device that allows a user to access the Internet or the World Wide Web (WWW), which is a device similar to a palm top computer. It is a further aim of the present invention, to offer a cost-competitive device. It is a further aim of the present invention, to increase the speed of refreshing the screen when the user clicks on a link and

10   commands another page to be displayed.

Currently, existing palm top devices such as the Palm Pilot VII and Windows CE type devices contain an operating system, and within the operating system a mini-browser to interpret information received from the WWW or Internet and

15   then display this information on the screen. This requires a powerful microprocessor, which is not advantageous in conserving power for portable applications and also minimizing costs.

With reference to applications 09/496,172, 09/501,585, 09/504,809, 09/504,808

20   and 09/504,807 whose embodiments are incorporated herein, the present invention discloses a method and system of storing previously viewed pages on the device. Thus a user is able to utilize a pointer or stylus tip to select and press a "back" button or a "forward" button to view previously accessed pages, and which pages are stored directly in the device. The invention further discloses a

25   method of enabling the used to scroll to a specific area thereby initiating downloading in that area, or by the user clicking on a specific area to initiate the downloading.

The principal embodiment of the present invention is disclosed in **Figure 1**. A

30   host computer **1** is depicted which is connected to the Internet, and that host may

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also be a Web server. Running in the host computer, is a Web server program **2**. When a remote user **3** requests to view a Web page (or electronic message etc.) the Web server software receives HTML, JAVA, or other types of information and transmits this information to another software, the Browser Translator **4**. This

5 software translates the information, (i.e. the entire image comprising graphics and text) received in the form of HTML, Java, etc. (as information may be gathered from different sources) and translates it to a black and white bit map or raster image. In another embodiment, the software translates the information into a raster or color image. The image **5**, as shown in **Figure 2**, contains the

10 information that would normally be displayed on a single Web page. The translation program therefore, also acts as a virtual browser **6**. As can be seen in **Figure 2**, the image **5** to be displayed in a browser window **6** is usually larger than the displayable area of the browser window **6**. The cellular telephone **12** of **Fig. 1** is connected to the high speed internet access device **18** of the invention

15 commonly referred to as a PDA (Personal Digital Assistant) which is comprised of a display screen **19**, battery and related micro-electronics. This enables the PDA to receive, decompress and view the bit map image sent from the virtual browser **6**, and more importantly, through cellular phone connectivity to be able to input data from the PDA directly onto the server. In particular, the host

20 computer or server receives vector information or compressed data in the form of HTML, JPEG, etc., which is displayed on a web page. The virtual browser virtually displays a virtual image on the server. That image, in whole or parts, is recompressed and sent to the PDA. The recompressed data format sent to the PDA, is not necessarily in the same format as the compressed data format first

25 received by the server, as illustrated in **Fig. 4**. For example, the incoming data from a Web page may be in the form of JPEG which is decompressed and displayed on the virtual browser. This data is recompressed and sent to the PDA but can be in the form of TIFF G4 or other formats, and not necessarily JPEG as initially received.

30 Another embodiment of the invention involves the server receiving vector information such as HTML or text and then rasterizing it to bit map format. It can

then shown in memory through the virtual browser and is recompressed through a "loss less" method and sent to the PDA.

5   The image **5** of **Fig. 2** is further divided into sections **7, 8, 9,** and **10,** as shown in **Figure 3**. The image is divided after the bitmap or raster is created. The reason for the division (as will be explained later) is for the purpose of display priority on the user's display. The image **5** is then sent to another program **11** running on the host computer **1 (Fig. 1),** which compresses the image using a loss-less compression method. The compression method may be group 3 or group 4, or
10   another method. The programs **4** and **11** can have multiple instances running simultaneously on the host server for the purpose of connecting to multiple users. The compressed image, after being processed by program **11,** is sent to the user, using a protocol in which information may be broken down into packets.

15   The information is received by the device **18** of the invention in **Fig. 5** which has the ability to display a monochrome image **20,** in its display window **19.** The information is decompressed and displayed in the order of priority such that part of image **7** of **Fig. 5,** which substantially or completely covers the displayable area **19** of the device, is decompressed and displayed first and then sequentially
20   the portions **8, 9** and **10** of the image are decompressed, and stored in an internal memory of the device to be displayed later when the user scrolls up, down, or sideways to these parts of the image.

In a further embodiment, the information received from the server by the device
25   **18** of the invention in **Fig. 5** remains compressed, and only the area viewed by the device is decompressed, since the area of a web page to be viewed is larger than the device's display area. As the user scrolls up, down or sideways, only the parts of the image to be displayed are decompressed prior to viewing.

30   A CPU resident in the device therefore has the ability to decompress a bit map or raster image that may be larger than the size of the display and allow the user to

traverse this bit map or raster image. The primary method of traversing the image is through conventional scroll bars positioned at the sides of the image. The resident CPU on the device has no ability to determine which part or parts of the image, that is being displayed, represent links to other Web pages etc. Thus,

5   the translator program **4 (Fig. 1)** translates the image in the virtual browser **6** such that the words that represent links on the page **5 (Fig. 2)** are translated to be slightly bolder. The user may therefore consider text that is bold to be links.

One embodiment of the invention comprises the PDA **18** of **Fig. 6** with an

10   electronic touch screen keyboard, which remains invisible and only appears on a portion of the display screen when called upon by touching the keyboard icon **21**. The entire display screen **19** is covered with a transparent touch panel, which is essentially a matrix array of electrodes, which can detect the location of any pressure points applied to it. The keyboard disappears when touching a

15   minimizing icon, revealing a refreshed image of the virtual browser. When the user is viewing the image displayed by a virtual browser on the PDA, and a text message needs to be entered at a specific location on the display, the user would have to point to this specific location, and pressing on the display screen's touch panel with a stylus tip **22**, the cursor appears at that exact location, ready

20   to input text. The keyboard would then be activated by pressing on the keyboard icon **21** with a stylus tip **22**, whereby a miniature keyboard layout **23** would appear at the bottom of the display screen **19** of **Fig. 7**, with a portion of the display screen **24** above the keyboard layout reserved to view text messages generated by the user, to be inputted in the virtual browser at a later time. As the

25   user enters text characters by pressing on various locations of the touch panel on the keyboard layout, the text message appears in the area **24** above the keyboard, and when the user is finished inputting text, pressing on the send or return icons would send the entire text message to the host computer at the specific location on the web page, at which time the server inserts text in the text

30   area or text box in the virtual browser. The virtual browser takes a refreshed image of the web page, rasterizes or draws it in its memory. This refreshed

portion of the virtual browser is sent back to the PDA as an image, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

5   The pointing device may be a touch screen or tracking ball, etc. As soon as the user clicks on part of an image, the shape of the pointer changes from an arrow to an hourglass. A message is sent to the host computer, transmitting the location of the clicked down event. A program **14** of **Fig. 1** interprets the message and provides a virtual click down in the virtual browser created in the

10   translator program **4**. If the user has pressed or clicked in an area of the image that does not represent a link or text box, a message is dispatched to the device which immediately changes the hourglass shape of the pointer back to an arrow (in the case of a touch screen, from an hour glass to nothing). Further to this, if the user has pressed or clicked on a part of the image which represents a link, a

15   new Web page is extracted from the Internet or WWW, translated by translator program **4** of **Fig 1** into a bit map or raster, and compressed by compression program **11** and dispatched to the device where a new page is displayed. In a further embodiment, the image **5** of **Fig. 2** may be continuously updated and translated and sent to the device where it is continuously being refreshed. This

20   occurs once every few seconds.

In a further embodiment of the invention, an automatic keyboard feature is available to the user when scrolling through the image of the virtual browser on the PDA, and a text message is to be entered at a specific location. The user

25   would point at the desired location to enter text and a keyboard layout **23** of **Fig. 7** automatically appears ready for text input. How this happens is that a message gets sent to the host computer which knows the user has selected an area which can accept text, whereby the host responds with a message to the PDA device that it is ready to accept the keyboard entry sequence, at which time

30   the PDA automatically pulls up the keyboard layout which appears at the bottom of the display screen **19**. As text is typed, the text message appears in the area

24 above the keyboard layout, and after the send or return icons are selected, the keyboard layout disappears and the message is sent to the specific location on the virtual browser. A refreshed portion of the virtual browser is sent back to the PDA **18** as an image, which displays the specific portion of the virtual

5   browser that text was entered into, to verify that text was inputted at the correct location.

In another embodiment, which communicates with the virtual browser in a similar fashion, the method of text transfer to the virtual browser is different. The display

10   screen **19** of **Fig. 8** would have the keyboard layout **23** at the bottom, with two smaller areas above, one being a text area **25** which displays text characters comprising the message being typed, and the other area **26** displaying a background portion of the virtual browser. For each text character that is selected and appears in the text area **25**, a message is sent to the virtual

15   browser **6** that tells which character is typed, and that specific text character is entered in the virtual browser in the portion of the image selected for text input. A refreshed portion of the virtual browser is sent back to the PDA **18** as an image, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

20   In a further embodiment, which communicates with the virtual browser in a similar fashion, the method of text transfer to the virtual browser is different. The display screen **19** of **Fig. 8** would have the keyboard layout **23** at the bottom, with two smaller areas above, one is a text area **25** which displays text characters comprising the message being typed, and the other area **26**

25   displaying a background portion of the virtual browser. For each text character that is inputted in the text area **25**, a message is sent to the virtual browser **6** informing of the specific matrix location selected on the keyboard window. This matrix location is translated at the server end to determine what character is selected as the mapped layout of each character on the PDA keyboard is known,

30   and this character entered in the virtual browser at the specific location selected. A refreshed portion of the virtual browser is sent back to the PDA **18** as an

image, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

In another embodiment of the invention, an external keyboard **27** of **Fig. 9** is featured which is used to enter text characters as required. The keyboard

5   interface **28** can be wired or wireless. When the user wishes to enter text remotely in the virtual browser **6**, the specific location for text entry is selected by pressing on the touch panel **19** directly over the text entry location, and a text window **29** appears in a portion of the display screen ready for text input. The text window is equipped with conventional scroll bars **30** which enable the user to

10   have a wider viewing access, since the entire image sent from the virtual browser is decompressed and stored in the PDA. The keyboard connected to the PDA is then used to input text, and when the enter key is pressed, the message gets sent as a string of text characters and the text window **29** disappears. The text message is entered in the virtual browser at the specific location selected. A

15   refreshed portion of the virtual browser is sent back to the PDA as an image, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

In a further embodiment of the invention, an external keyboard **27** of **Fig. 12** is also featured which is used to enter text characters as required. The keyboard

20   interface **28** can be wired or wireless. When the user wishes to enter text remotely in the virtual browser **6**, the specific location for text entry is selected by pressing on the touch panel **19** of the PDA directly over the text entry location. For each text character that is directly inputted through the keyboard, a message is sent to the virtual browser **6** that tells it which character is typed, and that

25   specific text character is entered in the virtual browser in the portion of the image selected for text input. A refreshed portion of the virtual browser is sent back to the PDA **18** as an image, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location.

In other embodiments of the invention, the image displayed in the virtual browser is compressed at the server in various amounts by different methods before sending to the PDA device. Different parts of the image are compressed in different ways. Parts of the image that are text images are compressed by G4

5   compression techniques. Other parts of the image containing pictures are compressed by JPEG compression techniques. The entire image is converted to a raster image but different parts are converted at different depths of color. Text portions can be compressed by "loss less" techniques, which will result in complete image reproduction with no errors in text upon decompression,

10 whereas pictures can be compressed by "lossy" techniques which upon decompression give a slightly degraded image quality for each compression. An image with black and white text and color graphics portions would be converted to a raster image, but only the text part of it reduced to black and white 1 bit and other graphics parts to 24 bit or other color raster images. Hence different parts

15 of the image can be converted or reduced to different depths of color to resemble an actual web page with picture in color and text in black and white. The depths of color can be set by the user depending on the quality of image required, which affects the speed of refreshing the screen which also depends on the amount of graphics displayed. Text and pictures from a web page would get compressed

20 separately at the server and then sent to the PDA. In the PDA, text or black and white portions of the image get decompressed first and displayed on the screen. Color portions get decompressed and are overlain in the image on the screen shortly after, enabling the user to view black and white portions of the image in advance. At the browser, the priority of decompression is determined by the

25 depth of color, with the minimum depth being decompressed first.

A further embodiment would take the entire image to be viewed including all text and pictures and convert it to 1 bit raster. This file is compressed by G4 or other loss less compatible methods and sent to the PDA. When received by the PDA,

30 this file is decompressed for the user to view the image, and the black and white portions are displayed first which can be done quickly and the graphics portions

are overlaid progressively with color. This enables an image to be viewed quickly without the fine details of graphics, which follow moments after.

In another embodiment of the invention, the user may save and store the rasterized Web pages in the memory of the device, and therefore be able to view offline the stored rasterized pages, at a later time. The advantage of this embodiment is that the user does not have to connect to the host server to view the saved Web pages.

In a further related embodiment, when not connected to the server the user can generate multiple text files which are stored in internal memory on the PDA device **18** of **Fig. 10**, which is equipped with flash RAM, a microprocessor, and related micro electronics. This is particularly useful in creating or responding to emails or other text related documents that are lengthy and may consume a lot of time to respond to. At a later time when the user is connected to the server, which has internet connection, the user can access an email account in which emails have to be responded to, or new ones sent. The exact location where text is to be entered in the virtual browser is selected with the stylus tip and the keyboard icon selected (or the keyboard appears automatically). The keyboard layout **23** appears at the bottom of the display screen **19** and a list of all saved files is displayed above this, represented by icons **31**. Pointing on each icon **31** allows the user to review each saved file in the area **32** and when the enter or send icon is pressed on the keyboard, the selected file is sent to the exact location on the virtual browser. A refreshed portion of the virtual browser is sent back to the PDA as an image, which displays the specific portion of the virtual browser that text was entered into, to verify that text was inputted at the correct location. The user can then send the file as an email or store it on the server as done conventionally.

In another embodiment of the invention, the server **1** contains the virtual browser **6** displaying part of a web page **34** such that the virtual browser contains some of the icons **35** displayed in the display screen **19** of the PDA **18**, as illustrated in

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Fig. 11. These icons on the virtual browser may not be the same icons in the display screen of the PDA, but there are different ways to communicate between the PDA icons and the virtual browser's icons in conjunction with menu driven commands. The PDA may contain more icons than displayed on the virtual

5　browser, so that an icon selected on the PDA screen may represent a command on the virtual browser not represented by an icon. In this particular embodiment, the PDA does the translation of which command is executed when a stylus is used to select an icon on the display screen's touch panel, and a message is sent to the virtual browser to execute that command at specific locations on the

10　virtual browser. For example, pressing the "back" icon on the PDA **18** is translated by the PDA and this command linked to the "back" icon on the virtual browser **6**, which can be in a different location. The PDA contains in its memory a mapped location address of all icons and menu commands on the server, so when an icon is selected on the display screen of the PDA, the PDA would link to

15　the appropriate command or commands on the server, which are immediately executed. A single command executed from the PDA **18** can also represent a sequence of commands on both the PDA and the virtual browser **6**. For example, when the address icon is selected on the PDA **18** a text box **36** appears below and the keyboard automatically appears on the PDA display

20　screen **19**, ready to input data into the text box. The PDA **18** would link the address in the text box **36** to the address box on the virtual browser and all text entered on the PDA gets inputted on the virtual browser. A single command executed from the PDA **18** can also be linked to menu driven commands on the virtual browser **6**. For example, when the user wishes to change the font size on

25　the PDA display screen which may not always be suitable for a variety of users, the font size icon **37** is selected from the display screen **19** and a link is made to pre-selected font sizes on the menu items on the server. Hence, selecting the font size icon on the PDA screen would change the size of the font displayed on both the server and the PDA. Repeatedly selecting the font size icon takes the

30　user progressively through all the pre-selected font sizes.

17

In another related embodiment, the server **1** of **Fig. 11** does all the translation of commands executed by the PDA **18** of the invention. Hence, the server has a mapped location of all icons on the PDA display screen **19**. When a command is executed by pressing on the touch screen of the PDA, a message is sent to the

5   server informing of the specific location selected. The server would translate this location to a command as intended by the user. A refreshed portion of the virtual browser is sent back to the PDA **18** as an image.

In another embodiment of the present invention, images are only refreshed when

10   an event occurs such as a mouse down event on a link or in a text box.

In a further embodiment only those portions of the image that changes may be transmitted from the host computer to the PDA device. Other images in the virtual browser that are continuously changing, such as banner advertisements,

15   may be the only other images sent to the PDA device as they change.

The PDA device only contains enough memory to store the current displayable page. When the user presses a back or forward button, a message is sent to the host server, and the host server sends the reference page. The back and

20   forward buttons etc. may be hard wired into the PDA device, or may be part of the display area.

Further to this, parts of the image representing buttons (and other elements) on the virtual browser may be sent as part of the compressed image and buttons

25   such as forward and back may be treated the same way as links are handled as previously described. In the principle embodiment therefore the back and forward buttons are hard coded as part of the device.

In another embodiment, the PDA device comprises a modem that permits the

30   device to connect to a cellular telephone in digital format.

In another embodiment, the connection to the cellular telephone is made through an analog modem connected to an ear jack of the cellular telephone.

In yet another embodiment of the present invention, the modem is replaced by an
5   analog modem that has the capability to be connected to a landline providing a standard 56kbps-type connection.

Further embodiments may provide connections through ISDN, cable modems etc.

10

In a further embodiment, the PDA device may contain a large screen to be used in a fashion similar to a home Internet appliance.

The invention has been described in detail with particular reference to the
15   preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

I claim:

1. A host computer system such that it receives information from the outside, rasterizes it, compresses the rasterized image and transmits it to a device,

5   which decompresses that image and displays it on a screen.

2. A host computer system that receives a compressed image from the outside, decompresses it then recompresses it and transmits it to a device, which decompresses that image and displays it on a screen.

10

3. A device as claimed in claims **1** or **2** such that information sent to the device remains compressed, and parts of the image viewed as a user scrolls through the image are decompressed, prior to viewing.

15   4. A device as claimed in claims **1** or **2** such that the information the host computer gets from the outside is from the Internet.

5. A device as claimed in claims **1** or **2** such that text characters selected on a touch screen keyboard appear in a text area, and when a send command is

20   executed on the device, a string of text characters from the text area is sent to a specific location on a virtual browser in the host computer, whereby the host computer sends a refreshed portion of the virtual browser back to the device as an image, to be displayed.

25   6. A device as claimed in claims **1** or **2** such that each text character selected on the device is sent and entered in a virtual browser in the host computer in a location selected for text input, whereby the host computer sends a refreshed portion of the virtual browser back to the device as an image, to be displayed.

30   7. A device as claimed in claims **1** or **2** such that for each text character selected on an electronic touch screen keyboard on the screen of the device, the

matrix locations of the touch screen are sent from the device to the host computer, which translates these into text characters subsequently entered in a virtual browser in the host computer in a location selected for text input, whereby the host computer sends a refreshed portion of the virtual browser

5   back to the device as an image, to be displayed.

8. A device as claimed in claims **1** or **2** such that when a user clicks on a location on the display, a message is sent to the host computer which determines if text input is required at that specific location, and if required, an

10   electronic touch screen keyboard is invoked and appears in the screen of the device.

9. A device as claimed in claims **1** or **2** such that an electronic touch screen keyboard on the screen of the device automatically disappears, when a text

15   message is sent from a text area on the screen of the device to a virtual browser in the host computer, whereby the host computer sends a refreshed portion of the virtual browser back to the device as an image, to be displayed.

10. A device as claimed in claims **1** or **2** such that an external keyboard with a

20   wired or wireless interface to the device inputs text in a text window on the screen of the device, with scroll bars for wider viewing access, whereby text messages from the text window are sent from the device to a virtual browser in the host computer as a string of text characters, whereby the host computer sends a refreshed portion of the virtual browser back to the device

25   as an image, to be displayed.

11. A device as claimed in claims **1** or **2** such that an external keyboard with a wired or wireless interface to the device inputs text in a text window on the screen of the device, whereby each text character selected is sent from the

30   device to a virtual browser in the host computer individually, whereby the host

computer sends a refreshed portion of the virtual browser back to the device as an image, to be displayed for each text character sent.

12. A device as claimed in claims **1** or **2** such that the image received and displayed in a virtual browser in the host computer, is compressed in various amounts in the host computer before sending to the device, whereby text portions of the image are compressed by methods that give no errors in decompression, and graphic portions of the image are compressed by less accurate means, such that text and graphics get compressed separately at the host computer and then sent to the device.

13. A device as claimed in claims **1** or **2** such that text and graphics from a web page on the host computer are converted to monochrome or color raster images of various depths of color, at a virtual browser in the host computer prior to compression and sending to the device.

14. A device as claimed in claims **1** or **2** such that at a virtual browser in the host computer, the priority of decompression is determined by the depth of color of the image, with the minimum depth being decompressed first.

15. A device as claimed in claims **1** or **2** such that text or monochrome portions of the image are decompressed first and displayed on the screen, with color portions decompressed and overlain in parts of the image shortly after.

16. A device as claimed in claims **1** or **2** such that the device contains internal memory with related micro-electronics to store and view rasterized web pages or other images.

17. A device as claimed in claims **1** or **2** such that the device contains internal memory with related micro-electronics to generate, store and view text files to

be transmitted to a virtual browser in the host computer at any time, when connected to a cellular phone or other transmitting means.

18. A device as claimed in claims **1** or **2** such that the screen of the device
5   contains icons which represent specific commands, linked to icons or menu items on a virtual browser in the host computer, such that the virtual browser may contain icons in different locations than icons on the device, whereby the device contains in a memory a mapped location address of all icons and menu commands on the virtual browser, such that any icon selected on the
10   device is linked to the appropriate command or sequence of commands on the virtual browser, which are immediately executed.

19. A device as claimed in claims **1** or **2** such that that the screen of the device contains icons which represent specific commands, linked to icons or menu
15   items on a virtual browser in the host computer, such that the virtual browser may contain icons in different locations than icons on the device, whereby the virtual browser has a mapped location of all icons on the device, such that a message is sent to the host computer for any command executed by the device, informing of the specific icon location selected which is translated into
20   appropriate commands.

ABSTRACT

The invention relates to a host computer system which receives information, rasterizes it, compresses it and transmits it to a portable device which

5   decompresses the image to display it on a screen. The image can be decompressed in whole or in parts to be viewed as the used scrolls through the image. An electronic touch screen keyboard is featured, which is used to input text characters in a text area on the screen of the device. Thereafter, text is transmitted to specific areas on a virtual browser in the host computer as a string

10   of characters, or individually, with refreshed images of the virtual browser sent back to the device for each transmission. The host computer system is also capable of translating locations on the touch screen of the device into text characters or commands. The image received by the virtual browser is compressed in different amounts, with text and graphics compressed separately

15   in different ways to be sent to the device, which can store and view received images. Icons on the device representing commands can be linked to icons or menu items on the virtual browser, by the device translating and linking to the host computer, or by the host computer translating.

Figure 1

Figure 2

13

8

7

9

Figure 3

10

RECOMPRESS

DECOMPRESS

TIFF G4

JPEG

JPEG

Vector
Text or
HTML

1
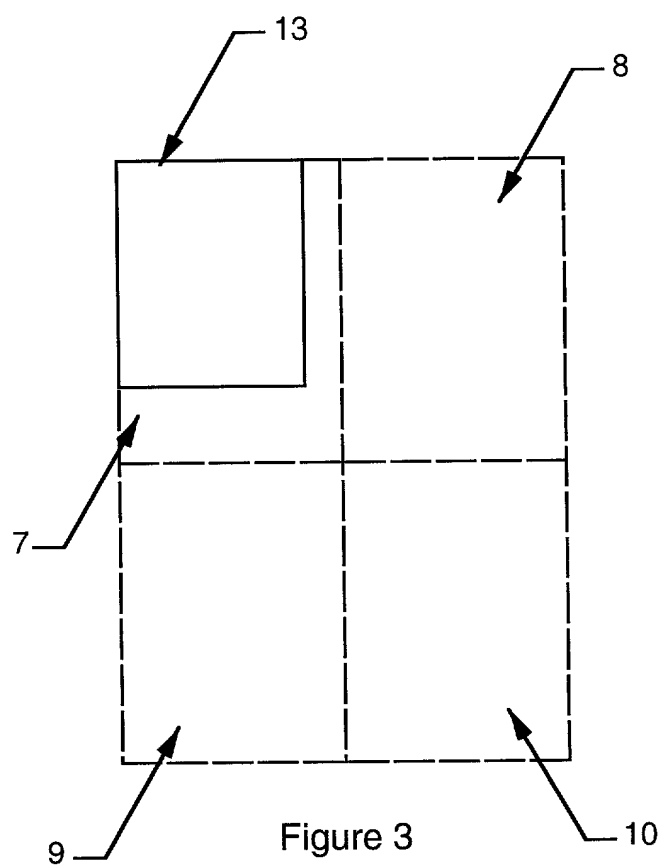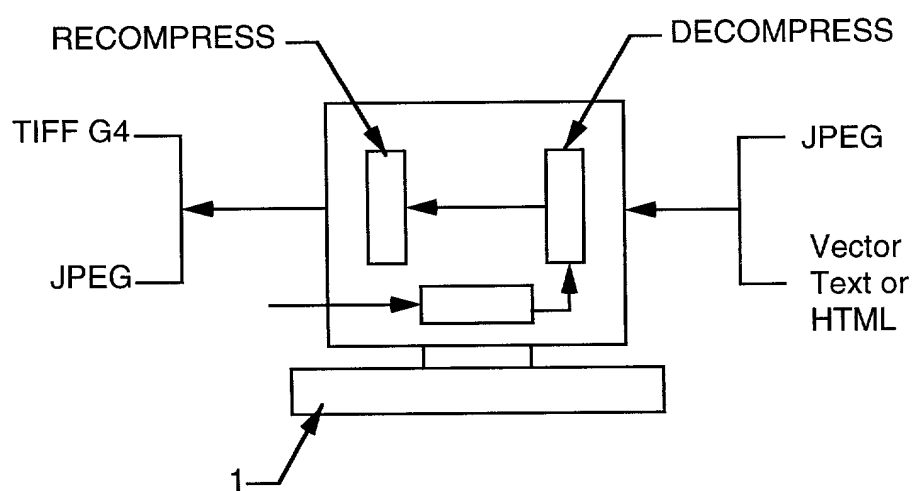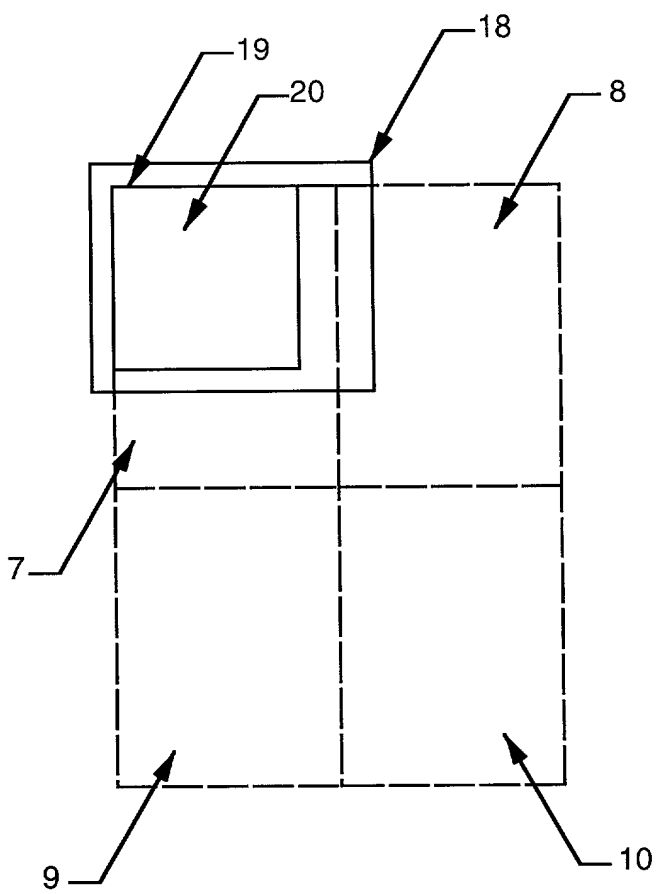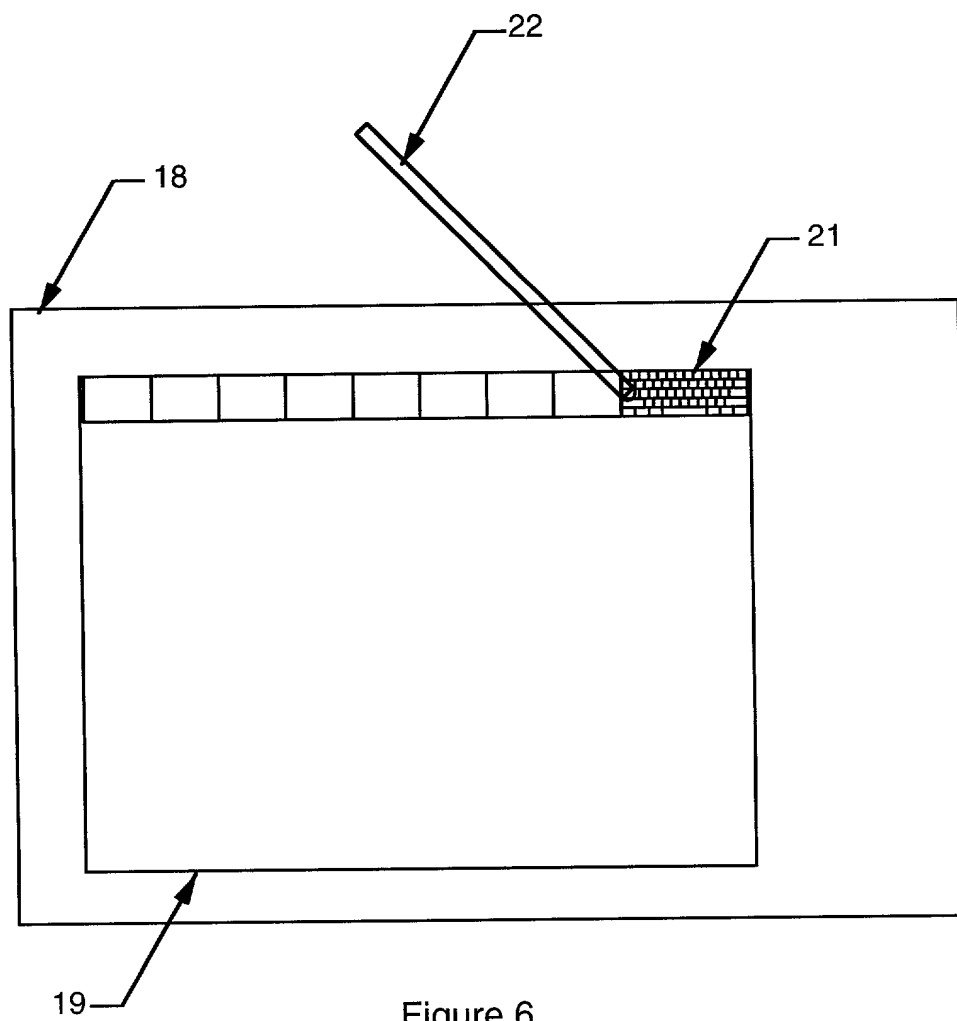
Figure 4

Figure 5

Figure 6
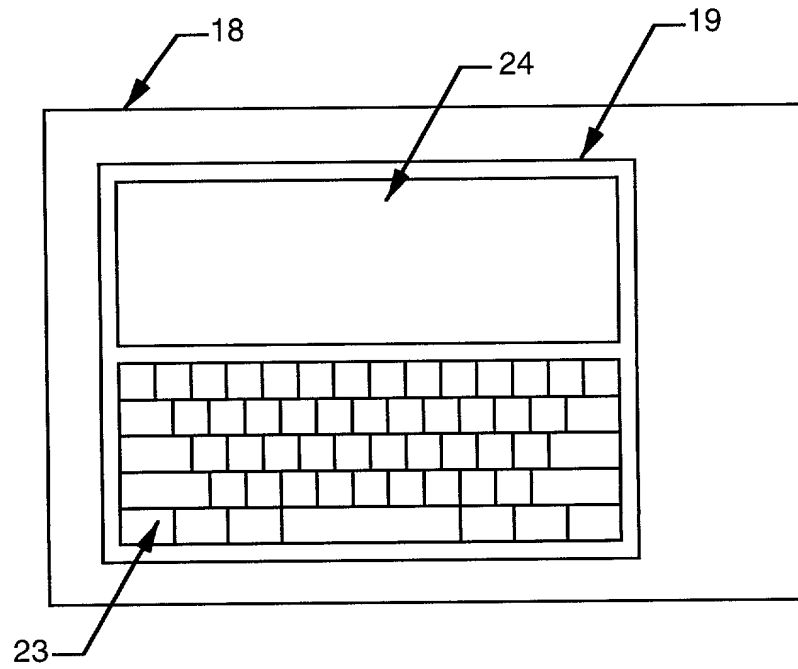
Figure 7
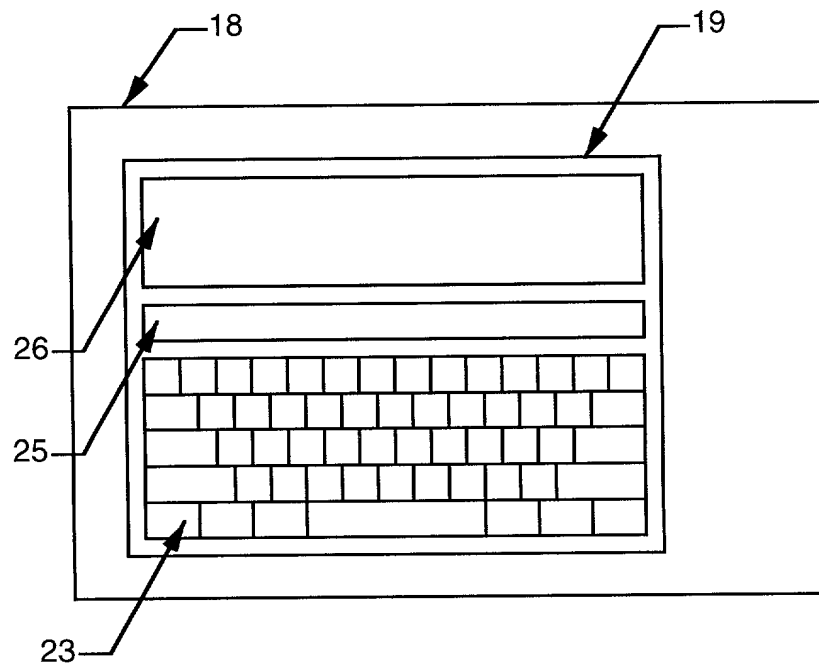
Figure 8
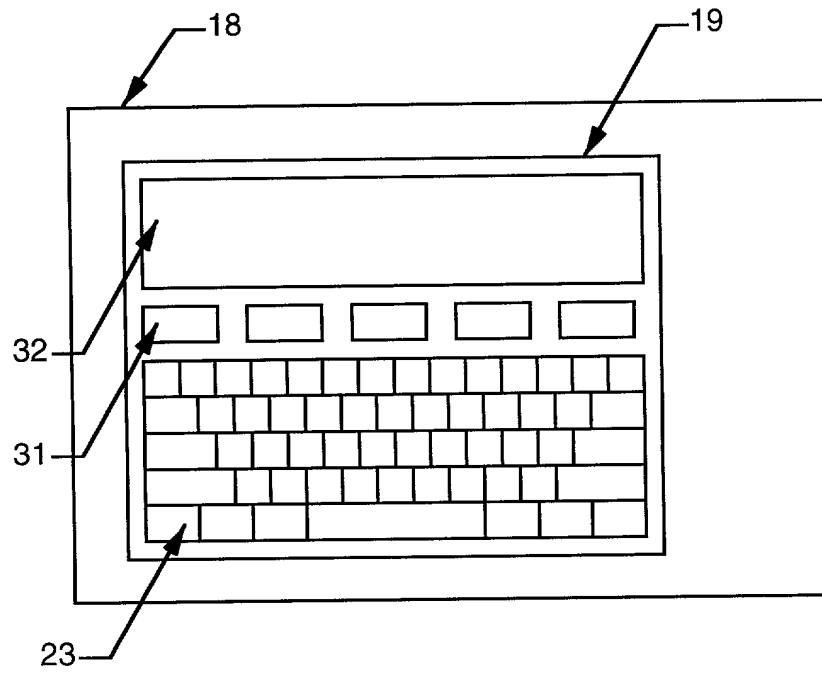
Figure 9

Figure 10

Figure 11

Figure 12

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)	Attorney Docket Number	
	First Named Inventor	
	COMPLETE IF KNOWN	
	Application Number	/
	Filing Date	
☐ Declaration Submitted with Initial Filing **OR** ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Group Art Unit	
	Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PORTABLE HIGH SPEED COMMUNICATION DEVICE

the specification of which   *(Title of the Invention)*

☑ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) [   ] as United States Application Number or PCT International

Application Number [   ] and was amended on (MM/DD/YYYY) [   ] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

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Application Number(s)	Filing Date (MM/DD/YYYY)	
		☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

Please type a plus sign (+) inside this box → ⊞

DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

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OR
☐ Registered practitioner(s) name/registration number listed below

Name	Registration Number	Name	Registration Number

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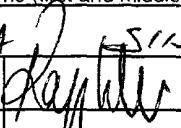Direct all correspondence to: ☐ Customer Number or Bar Code Label [_____] OR ☒ Correspondence address below

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
RAJA SINGH	TULI

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